

AMENDMENT TO THE CLAIMS:

Please cancel claims 1-56 without prejudice or disclaimer and add new Claims 57-68 as follows:

Claims 1-56 (cancelled)

Claim 57 (new) A hand-supportable digital imaging-based bar code symbol reading device supporting narrow-area and wide-area modes of illumination and image capture, said hand-supportable digital imaging-based bar code symbol reading device comprising:

- a hand-supportable housing having a light transmission aperture;

- a multi-mode area-type image formation and detection subsystem having image formation optics for producing a field of view (FOV) upon an object to be imaged and an area-type image sensing array for detecting imaged light reflected off the object during illumination operations in either (i) a narrow-area image capture mode in which a few central rows of pixels on the image sensing array are enabled, or (ii) a wide-area image capture mode in which substantially all rows of the image sensing array are enabled;

- a multi-mode LED-based illumination subsystem for producing narrow and wide area fields of LED illumination within the FOV of said image formation and detection subsystem during narrow and wide area modes of image capture, respectively;

- an image capturing and buffering subsystem for capturing and buffering 2-D images detected by the image formation and detection subsystem;

- a multimode image-processing based bar code symbol reading subsystem for processing images captured and buffered by said image capturing and buffering subsystem and reading 1-D and 2-D bar code symbols represented;

- an input/output subsystem for outputting processed image data to an external host system or other information receiving or responding device; and

- a system control subsystem for controlling and coordinating the greater of a plurality of said subsystems.

Claim 58 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein an IR-based object presence and range detection subsystem for producing an

IR-based object detection field within the FOV of the image formation and detection subsystem;  
and

an automatic light exposure measurement and illumination control subsystem for measuring the light exposure incident upon a central portion of said FOV, and for automatically controlling the operation of said LED-based multi mode illumination subsystem.

Claim 59 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 58, wherein said multi-mode LED-based illumination subsystem and said automatic light exposure measurement and illumination control subsystem are realized on an illumination board carrying components realizing electronic functions supported by said subsystems.

Claim 60 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein said multi-mode area-type image formation and detection subsystem is realized on a camera board carrying a high resolution CMOS-type image sensing array with randomly accessible region of interest (ROI) window capabilities.

Claim 61 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein said multi-mode image-processing bar code reading subsystem is realized on a computing platform including (i) a microprocessor, (ii) an expandable memory, (iii) SDRAM, and (iv) an FPGA FIFO configured to control the camera timings and drive an image acquisition process.

Claim 62 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 58, wherein said I/O subsystem is realized on an interface board.

Claim 63 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 58, wherein said IR-based object presence and range detection subsystem is realized using an IR-based object presence and range detection circuit.

Claim 64 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein the multi-mode LED-based illumination subsystem produces a first LED-

based illumination array for producing a narrow-area illumination field, a second LED-based illumination array for producing a near-field wide-area illumination field, and a third LED-based illumination array for producing a far-field wide-area illumination field, each having a narrow optical-bandwidth and confined within the FOV of the multi-mode image formation and detection subsystem during narrow-area and wide-area modes of imaging, respectively, thereby ensuring that only light transmitted from the multi-mode illumination subsystem and reflected from the illuminated object is ultimately transmitted through a narrow-band transmission-type optical filter subsystem realized by (1) high-pass (i.e. red-wavelength reflecting) filter element mounted at said light transmission aperture, and (2) low-pass filter element mounted either before said image sensing array or anywhere after said light transmission apertures.

Claim 65 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 64, wherein the narrow-band integrated optical filter subsystem ensures that said image sensing array only receives the narrow-band visible illumination transmitted by said LED-based illumination arrays driven by LED driver circuitry associated with said multi-mode illumination subsystem, whereas all other components of ambient light collected by the light collection optics are substantially rejected at the image sensing array, thereby providing improved SNR thereat, thus improving the performance of the system.

Claim 66 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 64, wherein the automatic light exposure measurement and illumination control subsystem to twofold: (1) to measure, in real-time, the power density of photonic energy (i.e. light) collected by the optics of the system at about said image sensing array, and generate auto-exposure control signals indicating the amount of exposure required for good image formation and detection; and (2) in combination with an illumination array selection control signal provided by the system control subsystem, automatically drive and control the output power of selected LED-based illumination arrays so that objects within the FOV of the system are optimally exposed to LED-based illumination and optimal images are formed and detected at the image sensing array.

Claim 67 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein said image capturing and buffering subsystem (1) detects the entire 2-D image focused onto said area-type image sensing array by said image formation optics, (2) generates a frame of digital pixel data for either a selected region of interest of the captured image frame, or for the entire detected image, and then (3) buffers each frame of image data as it is captured.

Claim 68 (new): The hand-supportable digital imaging-based bar code symbol reading device of claim 57, wherein the multi-mode imaging-based bar code symbol reading subsystem processes images that have been captured and buffered by the image capturing and buffering subsystem, during both narrow-area and wide-area illumination modes of system operation.